

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently amended) A method for operating a key distribution center
2 (KDC) that provides keys to facilitate secure communications between clients and
3 servers across a computer network, wherein the KDC operates without having to
4 store long-term server secrets, comprising:
5 receiving a communication from a server that is authenticated at the KDC;
6 wherein the communication includes a temporary secret key to be used in
7 communications with the server for a limited time period; and
8 storing the temporary secret key at the KDC, so that the temporary secret
9 key can be subsequently used to facilitate communications between a client and
10 the server, wherein the temporary secret key is encrypted with a public key
11 belonging to the KDC, so that the temporary secret key can only be decrypted
12 | using a private key belonging to the KDC;
13 wherein the temporary secret key becomes invalid after a specified time
14 | interval, which reduces the vulnerability of the KDC.

1 2. (Original) The method of claim 1, wherein upon subsequently receiving
2 a request from the client at the KDC to communicate with the server, the method
3 further comprises facilitating communications between the client and the server
4 by:
5 producing a session key to be used in communications between the client
6 and server;

7 creating a ticket to the server by encrypting an identifier for the client and
8 the session key with the temporary secret key for the server; and
9 assembling a message that includes the identifier for the server, the session
10 key and the ticket to the server; and
11 sending the message to the client in a secure manner; and
12 allowing the client to forward the ticket to the server in order to initiate
13 communications between the client and the server.

1 3. (Original) The method of claim 2, wherein upon receiving the ticket
2 from the client at the server, the method further comprises:
3 decrypting the ticket at the server using the temporary secret key to restore
4 the session key and the identifier for the client; and
5 using the session key at the server to protect subsequent communications
6 between the server and the client.

1 4. (Original) The method of claim 2, wherein assembling the message
2 involves including an expiration time for the session key in the message.

1 5. (Original) The method of claim 2, wherein allowing the client to
2 forward the ticket to the server includes allowing the client to forward an
3 identifier for the temporary secret key to the server, so that the server can know
4 which temporary secret key to use in decrypting the ticket.

1 6. (Original) The method of claim 2, wherein sending the message to the
2 client in the secure manner involves encrypting the message with a second session
3 key that was previously communicated to the client by the KDC.

1 7. (Original) The method of claim 2, further comprising alternatively
2 creating the ticket to the server by encrypting the identifier for the client and the
3 session key with one of:
4 a public key for the server; and
5 a secret key for the server previously agreed upon between the server and
6 the KDC and stored at the KDC.

1 8. (Original) The method of claim 1, wherein receiving the communication
2 from the server involves authenticating the server.

1 9. (Original) The method of claim 8, wherein authenticating the server
2 involves using authentication information pertaining to the server, the
3 authentication information including a certificate chain from a trust anchor to the
4 server, and including a server public key that is associated with a server private
5 key to form a public key-private key pair associated with the server.

1 10. (Original) The method of claim 8, wherein authenticating the server
2 involves authenticating the server without having prior configuration information
3 pertaining to the server at the KDC.

1 11. (Original) The method of claim 8, wherein authenticating the server
2 includes using a server public key that is stored locally in the KDC.

1 12 (Canceled).

1 13. (Original) The method of claim 1, wherein the communication is
2 signed with a server private key so that the KDC can use a corresponding server
3 public key to verify that the communication was sent by the server.

1 14. (Original) The method of claim 1, wherein the communication is
2 received in response to a request being sent by the KDC to the server indicating
3 that the temporary secret key is needed from the server.

1 15. (Original) The method of claim 1, further comprising communicating
2 information to the server that enables the server to authenticate the KDC.

1 16. (Original) The method of claim 1, wherein the KDC operates in
2 accordance with the Kerberos standard.

1 17. (Original) The method of claim 1, wherein the communication
2 received from the server additionally includes an identifier for the server.

1 18. (Original) The method of claim 1, further comprising propagating the
2 temporary secret key to multiple KDCs.

1 19. (Currently amended) A computer-readable storage medium storing
2 instructions that when executed by a computer cause the computer to perform a
3 method for operating a key distribution center (KDC) that provides keys to
4 facilitate secure communications between clients and servers across a computer
5 network, wherein the KDC operates without having to store long-term server
6 secrets, the method comprising:
7 receiving a communication from a server that is authenticated at the KDC;
8 wherein the communication includes a temporary secret key to be used in
9 communications with the server for a limited time period; and
10 storing the temporary secret key at the KDC, so that the temporary secret
11 key can be subsequently used to facilitate communications between a client and
12 the server, wherein the temporary secret key is encrypted with a public key

13 belonging to the KDC, so that the temporary secret key can only be decrypted
14 using a private key belonging to the KDC;
15 wherein the temporary secret key becomes invalid after a specified time
16 interval, which reduces the vulnerability of the KDC.

1 20. (Original) The computer-readable storage medium of claim 19,
2 wherein upon subsequently receiving a request from the client at the KDC to
3 communicate with the server, the method further comprises facilitating
4 communications between the client and the server by:
5 producing a session key to be used in communications between the client
6 and server;
7 creating a ticket to the server by encrypting an identifier for the client and
8 the session key with the temporary secret key for the server; and
9 assembling a message that includes the identifier for the server, the session
10 key and the ticket to the server; and
11 sending the message to the client in a secure manner; and
12 allowing the client to forward the ticket to the server in order to initiate
13 communications between the client and the server.

1 21. (Original) The computer-readable storage medium of claim 20,
2 wherein upon receiving the ticket from the client at the server, the method further
3 comprises:
4 decrypting the ticket at the server using the temporary secret key to restore
5 the session key and the identifier for the client; and
6 using the session key at the server to protect subsequent communications
7 between the server and the client.

1 22. (Original) The computer-readable storage medium of claim 20,
2 wherein assembling the message involves including an expiration time for the
3 session key in the message.

1 23. (Original) The computer-readable storage medium of claim 20,
2 wherein allowing the client to forward the ticket to the server includes allowing
3 the client to forward an identifier for the temporary secret key to the server, so that
4 the server can know which temporary secret key to use in decrypting the ticket.

1 24. (Original) The computer-readable storage medium of claim 20,
2 wherein sending the message to the client in the secure manner involves
3 encrypting the message with a second session key that was previously
4 communicated to the client by the KDC.

1 25. (Original) The computer-readable storage medium of claim 20,
2 wherein the method further comprises alternatively creating the ticket to the server
3 by encrypting the identifier for the client and the session key with one of:
4 a public key for the server; and
5 a secret key for the server previously agreed upon between the server and
6 the KDC and stored at the KDC.

1 26. (Original) The computer-readable storage medium of claim 19,
2 wherein receiving the communication from the server involves authenticating the
3 server.

1 27. (Original) The computer-readable storage medium of claim 26,
2 wherein authenticating the server involves using authentication information
3 pertaining to the server, the authentication information including a certificate

4 chain from a trust anchor to the server, and including a server public key that is
5 associated with a server private key to form a public key-private key pair
6 associated with the server.

1 28. (Original) The computer-readable storage medium of claim 26,
2 wherein authenticating the server involves authenticating the server without
3 having prior configuration information pertaining to the server at the KDC.

1 29. (Original) The computer-readable storage medium of claim 26,
2 wherein authenticating the server includes using a server public key that is stored
3 locally in the KDC.

1 30 (Canceled).

1 31. (Original) The computer-readable storage medium of claim 19,
2 wherein the communication is signed with a server private key so that the KDC
3 can use a corresponding server public key to verify that the communication was
4 sent by the server.

1 32. (Original) The computer-readable storage medium of claim 19,
2 wherein the communication is received in response to a request being sent by the
3 KDC to the server indicating that the temporary secret key is needed from the
4 server.

1 33. (Original) The computer-readable storage medium of claim 19,
2 wherein the method further comprises communicating information to the server
3 that enables the server to authenticate the KDC.

1 34. (Original) The computer-readable storage medium of claim 19,
2 wherein the KDC operates in accordance with the Kerberos standard.

1 35. (Original) The computer-readable storage medium of claim 19,
2 wherein the communication received from the server additionally includes an
3 identifier for the server.

1 36. (Original) The computer-readable storage medium of claim 19,
2 wherein the method further comprises propagating the temporary secret key to
3 multiple KDCs.

1 37. (Currently amended) An apparatus that provides keys to facilitate
2 secure communications between clients and servers across a computer network,
3 wherein the apparatus operates without having to store long-term server secrets,
4 comprising:
5 a key distribution center (KDC);
6 a receiving mechanism within the KDC that is configured to receive a
7 communication from a server;
8 wherein the communication includes a temporary secret key to be used in
9 communications with the server for a limited time period; and
10 a storage mechanism within the KDC that is configured to store the
11 temporary secret key at the KDC, so that the temporary secret key can be
12 subsequently used to facilitate communications between a client and the server,
13 wherein the temporary secret key is encrypted with a public key belonging to the
14 KDC, so that the temporary secret key can only be decrypted using a private key
15 belonging to the KDC;
16 wherein the temporary secret key becomes invalid after a specified time
17 interval, which reduces the vulnerability of the KDC.

1 38. (Original) The apparatus of claim 37, further comprising a
2 communication facilitation mechanism within the KDC, wherein upon receiving a
3 request from the client to communicate with the server, the communication
4 facilitation mechanism is configured to:
5 produce a session key to be used in communications between the client
6 and server;
7 create a ticket to the server by encrypting an identifier for the client and
8 the session key with the temporary secret key for the server;
9 assemble a message that includes the identifier for the server, the session
10 key and the ticket to the server;
11 send the message to the client in a secure manner; and to
12 allow the client to forward the ticket to the server in order to initiate
13 communications between the client and the server.

1 39. (Original) The apparatus of claim 38, further comprising a mechanism
2 within the server that is configured to:
3 decrypt the ticket received from the client using the temporary secret key
4 to restore the session key and the identifier for the client; and to
5 use the session key to protect subsequent communications between the
6 server and the client.

1 40. (Original) The apparatus of claim 38, wherein the communication
2 facilitation mechanism is configured to include an expiration time for the session
3 key in the message.

1 41. (Original) The apparatus of claim 38, wherein the client is configured
2 to additionally forward an identifier for the temporary secret key to the server, so

3 that the server can know which temporary secret key to use in decrypting the
4 ticket.

1 42. (Original) The apparatus of claim 38, wherein in sending the message
2 to the client in the secure manner, the communication facilitation mechanism is
3 configured to encrypt the message with a second session key that was previously
4 communicated to the client by the KDC.

1 43. (Original) The apparatus of claim 38, wherein the communication
2 facilitation mechanism is configured to alternatively create the ticket to the server
3 by encrypting the identifier for the client and the session key with one of:
4 a public key for the server; and
5 a secret key for the server previously agreed upon between the server and
6 the KDC and stored at the KDC.

1 44. (Original) The computer-readable storage medium of claim 37, further
2 comprising an authentication mechanism that is configured to authenticate the
3 server.

1 45. (Original) The apparatus of claim 44, wherein in authenticating the
2 server, the authentication mechanism is configured to use authentication
3 information pertaining to the server, the authentication information including a
4 certificate chain from a trust anchor to the server, and including a server public
5 key that is associated with a server private key to form a public key-private key
6 pair associated with the server.

1 46. (Original) The apparatus of claim 44, wherein in authenticating the
2 server the authentication mechanism is configured to operate without having prior
3 configuration information pertaining to the server at the KDC.

1 47. (Original) The apparatus of claim 44, wherein in authenticating the
2 server, the authentication mechanism is configured to use a server public key that
3 is stored locally in the KDC.

1 48 (Canceled).

1 49. (Original) The apparatus of claim 37, wherein the communication is
2 signed with a server private key so that the KDC can use a corresponding server
3 public key to verify that the communication was sent by the server.

1 50. (Original) The apparatus of claim 37, further comprising a requesting
2 mechanism within the KDC that is configured to send a request to the server
3 indicating that the temporary secret key is needed from the server.

1 51. (Original) The apparatus of claim 37, further comprising a sending
2 mechanism that is configured to send information to the server that enables the
3 server to authenticate the KDC.

1 52. (Original) The apparatus of claim 37, wherein the KDC is configured
2 to operate in accordance with the Kerberos standard.

1 53. (Original) The apparatus of claim 37, wherein the communication
2 received from the server additionally includes an identifier for the server.

1 54. (Original) The apparatus of claim 37, wherein the storage mechanism
2 is additionally configured to communicate the temporary secret key to multiple
3 KDCs.